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Geranylgernayl pyrophosphate synthases

Description of Technology: This invention is in the field of plant molecular biology. More specifically, this invention pertains to nucleic acid fragments encoding geranylgeranyl pyrophosphate synthase or geranylgeranyl pyrophosphate synthase-related protein in plants and seeds.

Patent Listing:

1. **US Patent No. 6,410,827**, Issued June 25, 2002, "Geranylgernayl pyrophosphate synthases"
   http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6410827

Market Potential: Geranylgeranyl pyrophosphate (GGPP) synthase, also known as geranylgeranyl-diphosphate synthase, farnesyl transferase and geranylgeranyl synthetase is a key enzyme in plant terpenoid biosynthesis.

GGPP also serves as precursor in the formation of defense-related substances like the phytoalexin casbene in castor bean and the diterpene phorbol which acts as a toxin against herbivores. GGPP is also a precursor of the important phytohormone gibberellin which regulates a variety of physiological processes that include initiation of seed germination, stimulation of stem elongation, stimulation of flowering/bolting and regulation of leaf/fruit senescence.

In animal systems, the importance of the enzyme GGPP synthase is demonstrated by the lethality of nonsense mutations in the locus that encodes the enzyme in Drosophila (Lai et al. (1998) Genetics 149:1051-1061). In plant systems, GGPP serves as precursor to many important metabolites that the enzyme responsible for its synthesis, GGPP synthase, appears to be an attractive target for herbicide discovery and design.

Manipulation of the corn gene in endosperm could result in increased xanthophyll content, which has value as coloring agent in poultry feed.

Benefits:

- Ability to better engineer and understand plants and seeds

Applications:

- Plant molecular biology
- Herbicides
- Coloring agent in poultry feed

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